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| 09/329,502      | 06/10/1999  | JAMES T. MERRILL     | 31223-62785         | 8162             |

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EXAMINER

DANG, THUAN D

ART UNIT PAPER NUMBER

1764

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 22

Application Number: 09/329,502  
Filing Date: June 10, 1999  
Appellant(s): MERRILL ET AL.

**MAILED**

DEC 05 2003

**GROUP 1700**

William Jackson  
For Appellant

**RESPONSE TO THE REMAND**

This is in response to the Remand from the Board of Appeal to the Examiner on  
1/29/2003.

(1) In the Remand to the examiner on 1/29/2003, the Board of Appeal focuses on the  
legality of the terminal disclaimer which was signed by an attorney of record.

(2) In the Remand to the examiner on 1/29/2003, the Board of Appeal also vacated the  
decision by the Board on 9/30/02 which affirmed (a) the examiner's rejection of claims 1-6, 8,  
and 9 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as

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disclosed by applicants in the specification) and (b) the examiners' rejection of claims 10-13 and 18-20 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 467,007), and (c) the double patenting rejection of 1-6, 9-13, and 15-21 over US patent 5,955,642 in view of West (5,324,877).

(3) Also in the Remand to the examiner on 1/29/2003, the Board of Appeal ordered the examiner to consider the terminal disclaimer on the record of this application and respond by a Supplemental Examiner's Answer which includes the examiner's complete position, statement of rejections, and the examiner's complete response to the arguments.

Regarding (1), the terminal disclaimer is now proper and has been recorded as shown in the paper "Subject Decision on Terminal Disclaimer Informal Form" by paralegal clerk Debbie Thomas of Tech Center 1700.

Regarding (2), after reviewing the Decision by Board on 9/30/2002, the examiner does not change the examiner's position in (a) the rejection of claims 1-6, 8, and 9 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification) and (b) the examiners' rejection of claims 10-13 and 18-20 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 467,007). Since, (c) the double patenting rejection of claims 1-6, 9-13, and 15-21 over US patent 5,955,642 in view of West (5,324,877) has been overcome by a proper terminal disclaimer, the double patenting rejection has been withdrawn. As a result, only claims 21 and 15-17 which are not rejected by any prior art

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are in the condition of allowance. The examiner respectfully requests the Board of Appeal to affirm again the rejection made by the examiner of claims 1-6, 8, and 9 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification) and (b) the examiners' rejection of claims 10-13 and 18-20 under 35 USC 103 over West (5,324,877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 467,007).

Regarding (3), Below is the supplemental examiner's answer which is substantially unchanged from the examiner's answer sent to the Board on 2/23/2001 except that in "Status of Claims", the statement "Once, a proper terminal disclaimer is submitted to overcome the double patenting rejection, claims 21, 15-17 should be allowed" has been deleted since these claims 21 an 15-17 are now in the condition of allowance.

#### **SUPPLEMENTAL EXAMINER'S ANSWER**

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is incorrect. A correct

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statement of the status of the claims is as follows: the double patenting rejection of claims 1-6, 8-13, and 15-21 as discussed in the final rejection is overcome since the terminal disclaimer submitted on 1/29/2001 is properly signed by an attorney of record. Therefore, claims 21, 15-17 are now in the condition of allowed.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because appellants do not argue claims separately (see the arguments).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

|                 |             |        |
|-----------------|-------------|--------|
| 5,324,877       | West et al. | 6-1994 |
| EP 0 467 007 A1 | Butler      | 1-1992 |

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

The Board of Appeal are respectfully reminded that since the amendment after final Office action has been entered, the new ground rejections of claims are applied as below.

*Claims 1-6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5, 321, 877) alternatively in view of the admitted prior art (as disclosed by applicants in the specification).*

West discloses a liquid-phase<sup>step d of claim 1</sup> process of transalkylating polyalkylated aromatic components, such as diethylbenzene<sup>step b of claim 1, claim 4, and claim 5</sup> with benzene<sup>step c of claim 1</sup> in the presence of a typical Y-zeolite having<sup>step a of claim 1, claim 2, and claim 3</sup> a surface area of 350m<sup>2</sup>/gram, a pore size of greater than 7 angstroms, and a silica/alumina of 3 to 6 in a transalkylation zone to produce mono-alkyl benzene, such as ethylbenzene<sup>step d of claim 1</sup> (the abstract; col. 5, line 54 through col. 6, line 5; col. 12, lines 21-26).

West also discloses in figure 1 that the transalkylation product is recovered as called for in step a of claim 1.

Regarding claim 6, figure 1 of the patent to West shows that transalkylation product stream 62 is separated in separation columns 36, 42, and 48, and that polyethylbenzene being unreacted in the transalkylation process, if present, is recycled to transalkylation zone 60.

West discloses that the transalkylation process is operated by reacting unreacted benzene and polyalkylated benzenes recovered from an up-stream alkylation effluent produced by alkylating benzene with ethylene<sup>step f of claim 1, claim 8, and claim 9</sup> in an alkylation zone containing a molecular sieve, such as Y-zeolite, and silicalite (the abstract; figure 1, col. 3, lines 34-56; col. 10, lines 27 through col. 13, line 10).

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West does not disclose that the average pore size of silicalite is **less than** the average pore size of Y-zeolite<sup>step f of claim 1</sup>. However, applicants disclose so on page 3, lines 9-14 in the specification of this application.

West does not **specifically** disclose using a molecular sieve having a smaller pore size than Y-zeolite for the alkylation process. However, **applicants admit that** "the molecular sieves employed in the separate alkylation and transalkylation reactors can be the same or different . . . it is often the practice to employ a relatively small to intermediate pore size molecular sieve . . . in the alkylation reactor and follow this with a molecular sieve having somewhat larger pore size. . ." (see page 3, lines 9-14 in the specification of this application). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the West process by operating the alkylation process in the presence of a molecular sieve having smaller pore size, such as silicalite and operating the transalkylation process in the presence of a larger pore size, such as Y-zeolite to arrive at the applicants' claimed process as called for in claim 1, namely step (f) since this selection of catalysts for alkylation and transalkylation processes in an alkylation-and-transalkylation-process is often practiced in the industry as admitted by applicants (see page 3, lines 9-14 in the specification of this application).

The limitation of step h of claim 7 can be found in figure 1 of the patent to West.

*Claims 10-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (5, 324, 877) in view of the admitted prior art (as disclosed by applicants in the specification) further in view of Butler (EP 167, 007).*

West discloses a process as discussed by the examiner in the above 103 rejection.

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West does not disclose further that the alkylation process is operated in the gas-phase in a multistage alkylation reaction zone having a plurality of series catalyst beds (see the whole patent to West). However, Butler et al disclose a substantially the same process as the West process in which the alkylation of benzene with ethylene in the presence of silicalite or ZSM-5 molecular sieve is carried out in the gas phase in a multistage alkylation reaction zone having a plurality of series catalyst beds<sup>steps a and c of claims 10 and 18</sup> (the abstract; page 7, lines 45-59).

It would have been obvious to one having ordinary skill in the art at the time invention was made to have modified the West process by operating the alkylation process in the gas phase and by using a multistage alkylation reaction zone having a plurality of series catalyst beds if a silicalite or ZSM-5 zeolite is used for the alkylation process since Butler discloses that "the alkylation step can be conducted as a vapor-phase reaction employing a catalyst such as silicalite or ZSM-5. It is known that silicalite or ZSM-5 is a pentasil zeolite<sup>step a of claim 18</sup>.

West discloses recycling unreacted benzene to alkylation reaction zone 24<sup>step f of claims 10 and 18</sup> through lines 38, 16, 14, and 22.

Other limitations recited in steps of claims 10, 18, dependent claims 11-13, and 19-20 which are not mentioned in this rejection have already been discussed fully in the 103 rejection above.

**(11) Response to Argument**

The argument that the West Y-zeolite catalyst containing 5 % water having a surface area of 563 m<sup>2</sup>/g is produced by hydrating a raw Y-zeolite having a surface area of 450 m<sup>2</sup>/g is not persuasive since as discussed in the above rejection, the West Y-zeolite has the surface area of at least 350 m<sup>2</sup>/g (see the paragraph bridging columns 5 and 6 of the West reference and page 9 of



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the appeal brief) **not** 450 m<sup>2</sup>/g as assumed by appellants. Further, West discloses that the Y zeolite catalyst contains above 3.5 weight percent of water, **not** 5 weight percent of water as assumed by appellants. Therefore, the examiner maintains that once a starting Y-zeolite having a different surface area, such as 350 m<sup>2</sup>/g, is used to produce the final Y-zeolite containing a different amount of water, such as 3.5 wt%, this final Y-zeolite catalyst would be expected to have the appellants' claimed surface area.

The argument that West does not disclose using the Y-zeolite in the transalkylation reactor and employing another catalyst having pore size less than the same of the Y zeolite for the alkylation reactor is not persuasive since as admitted by applicants in page 3, lines 9-14 of the specification of this application, "it is often the practice to employ a relatively small to intermediate pore size such as ZSM-5, ZSM-11, or silicalite in the alkylation reaction and follow this with a molecular sieve having somewhat larger pore size, such as zeolite-Y. . .".

The argument that the examiner improperly uses the appellants' own disclosure in the rejection is not persuasive since as discussed, the method of using "a relatively small to intermediate pore size such as ZSM-5, ZSM-11, or silicalite in the alkylation reaction and follow this with a molecular sieve having somewhat larger pore size, such as zeolite-Y" is not invented by appellants, but is often practiced in the chemical industry.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Thuan D. Dang  
Primary Examiner  
Art Unit 1764

9as329502.supans  
October 3, 2003

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A handwritten signature in black ink, appearing to read 'Thuan D. Dang', is written over a horizontal line. The signature is stylized with a large loop and a long, sweeping tail.